

REMARKS

Upon entry of the present Preliminary Amendment-A the claims in the application are claims 1-3, 6-10, 13-15 and 17-21, of which claims 1, 2, 7, 10, 14 and 18 are independent.

In the above amendments, new claims 20, 21 further define aspects of the light scattering particle detector of claim 2 and the laser oscillator of claim 18.

Applicant respectfully submits that all of the amendments presented are fully supported by the original disclosure, including Figs. 1, 5 and 6, and the discussion at page 14 of the specification.

Further, applicant respectfully submits that the above amendments do not introduce any new matter into the application.

Allowed and Allowable Subject Matter

Applicant gratefully acknowledges the Examiner's allowance of claims 1, 7-10 and 13, as well as the Examiner's indication that claim 3 contains allowable subject matter, set forth at items 1-3 of the Office Action

Rejection Under 35 USC 112

At item 5 of the Office Action, the Examiner has rejected claims 2, 3, 6, 14, 15 and 17-19 under 35 USC 112, second paragraph, as failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically, it is the Examiner's position that: independent claims 2 and 14 (as well as claims 6, 14, 15, 17 depending therefrom) are indefinite because they do not claim the main aspect of the invention in the form of some structure which prevents the pumping of laser light from irradiating back upon the semiconductor laser, which is presented as the main focus of the invention at page 5, lines 18-25 of the specification; and that claims 18-19 omit essential structural elements, i.e., a concave mirror present in all embodiments of the disclosed invention.

Applicant's Response

Upon careful consideration applicant respectfully traverses such rejection, and submits that each of the rejected claims is adequately definite within the guidelines of 25 USC 112, second paragraph, based on the following.

First, applicant respectfully submits that while the provision of structure which prevents the pumping of laser light from irradiating back upon the semiconductor laser is a focus of the invention, such as discussed at page 5, lines 18-25, it is *not the only or main focus* of the invention. This is clear from the discussion at page 5, lines 11-25 of the specification, which indicates that described laser oscillator as "*an (one) aspect* of the present invention (emphasis added)", as well as the other discussion at pages 5-12 of the specification describing other aspects of the invention. Other focuses of the invention include: the embodiment of Fig. 21 in which an elongated transverse mode pattern is irradiated to the solid-state laser (such that it is possible to broaden the width of the particle detecting region without deteriorating the energy density /intensity of the laser light), which is discussed as an object/focus of the invention at pages 4 and 12 of the specification; and the embodiment of Figs. 5-6 describing how an (a predetermined) angle between the laser light and the laser medium is determined so as to prevent the pumping laser light from being incident on the light emitting portion of the semiconductor laser as feedback light, discussed as an aspect of the invention at page 7 of the specification.

Similarly, applicant respectfully submits that not all embodiments of the disclosed invention include a concave mirror, contrary to the Examiner's allegation, e.g., the embodiment of Fig. 5. While the embodiment of Fig. 5 includes a reflecting mirror 54, such mirror does not correspond to (does not perform the same function as) the concave mirror described in several of the claims (which corresponds to the mirrors 5, 22, 32, 42, 172 in other embodiments of the invention), i.e., it does not serve a function of preventing the pumping of laser light from irradiating back upon the semiconductor laser.

Further, applicant respectfully submits that the language of the rejected claims would be clearly understood by persons skilled in the art, especially when considered in light of the specification, which the courts have held is appropriate to satisfy the definiteness requirement of 35 USC 112, second paragraph. It is noted that the Examiner does not identify any language in the claims which is unclear in meaning.

Based on the foregoing, the rejection under 35 USC 112, second paragraph, is believed to be overcome, and accordingly it is respectfully requested that the rejection be reconsidered and withdrawn.

Art-Based Rejections

At item 7 of the Office Action, the Examiner has rejected claims 2, 6, 18; 19 under 35 USC '102(b) as being anticipated by DeFreez et al.(US Patent 6,111,642), while at item 10 of the Office Action, the Examiner also rejects claims 14, 15, 17 under 35 USC '103(a) as being unpatentable over DeFreez et al., particularly by the particle detector structure generally disclosed in relation to his Fig. 1.

Applicant's Response

1. Upon careful consideration applicant respectfully traverses such rejection, and submits that each of claims 2, 6, 14, 15 and 17-19 is clearly patentably distinct over DeFreeze's particle detector, because DeFreez does not disclose or suggest features as defined in the rejected claims, and DeFreez's particle detector does not achieve the advantages which are achieved by the claimed invention as discussed in the specification.
2. For example, independent claim 2 defines that the laser light from the semiconductor laser is condensed to irradiate upon the flow path by the concave mirror, while the light from the diode laser pump is condensed by the lens (mode matching optics?), rather than by a concave mirror in DeFreez. While DeFreez's detector includes a concave mirror, (high reflectance or HR resonator mirror 66 as discussed at his column 4, line 57), such mirror is semi-transparent and has a different function and different position/arrangement than the claimed concave mirror. Particularly, in the 2-dimensional depiction of the detector in DeFreez's Fig. 1 the HR resonator mirror (high reflectance resonance mirror 66) is disposed between his diode laser and the fluid sample flow path emanating from his nozzle 16, such that the reflective surface of the mirror faces away from the laser.

2. Relative to claims 14-15, applicant again respectfully submits that DeFreez's HR resonant mirror 66 does not condense light from the laser to irradiate upon the solid-state laser crystal 44 as discussed above, while further DeFreez never discloses or suggests the additional features of a reflector and/or a condenser having different radii of curvature in the parallel direction and the perpendicular direction with respect to the flow path.

In this regard, applicant notes the Examiner's stated position that it is obvious to have different radii of curvature for a desired focal length and concentration of light. However, it is respectfully submitted that the claimed features are not at all suggested by DeFreez's disclosure, as reflected by the fact that these features achieve a very significant advantage over conventional arrangements such as that of DeFreez, i.e., as discussed on pages 41- 42 of the present specification, the elongated transverse mode pattern formed according to the claimed features broadens the width of the particle detecting region without deteriorating the energy density/intensity of the laser light.

3. Relative to claim 18, applicant respectfully submits that DeFreez's detector does not include or suggest the claimed feature of determining an angle (predetermined angle) between the semiconductor laser and the laser medium so as to prevent the pumping laser light from being incident on the light emitting portion of the semiconductor laser as feedback light, whereas this feature achieves significantly improved results as discussed in the present specification. As shown in DeFreez's Fig. 1, the diode pump laser 12 is directly aligned with the solid state crystal 64 because these components share the same optical axis (as do the mirrors and 48, 66 and the view volume). Thus, the laser 12 does not have a predetermined angle relative to optical axis of the laser medium, and feedback light can be incident on the light emitting portion of the diode pump laser.

4. Based on the foregoing, the rejections of claims 2, 6, 14, 15 and 17-19 based on DeFreez are believed to be overcome, and accordingly it is respectfully requested that the rejections be reconsidered and withdrawn.

Conclusion

In conclusion, applicant has overcome the Examiner's objections and rejections as presented in the Office Action; and moreover, applicant has considered all of the references of record, and it is respectfully submitted that the invention as defined by each of the present claims is clearly patentably distinct thereover.

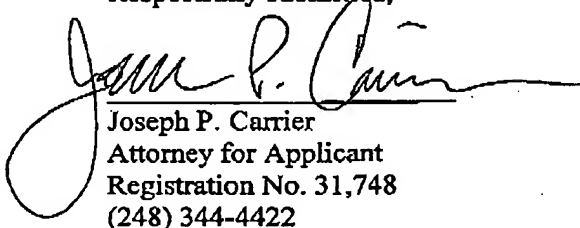
The application is now believed to be in condition for allowance, and a notice to this effect is earnestly solicited.

If the Examiner is not fully convinced of all of the claims now in the application, applicant respectfully requests that she telephonically contact applicant's undersigned representative to expeditiously resolve prosecution of the application.

Favorable reconsideration is respectfully requested.

Respectfully submitted,

Customer No. 21828
Carrier, Blackman & Associates, P.C.
24101 Novi Road, Suite 100
Novi, Michigan 48375
24 December 2003


Joseph P. Carrier
Attorney for Applicant
Registration No. 31,748
(248) 344-4422

CERTIFICATE OF TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent & Trademark Office, Art Unit 2828, at (703) 872-9306 on December 24, 2003.

JPC/ms
enclosures

